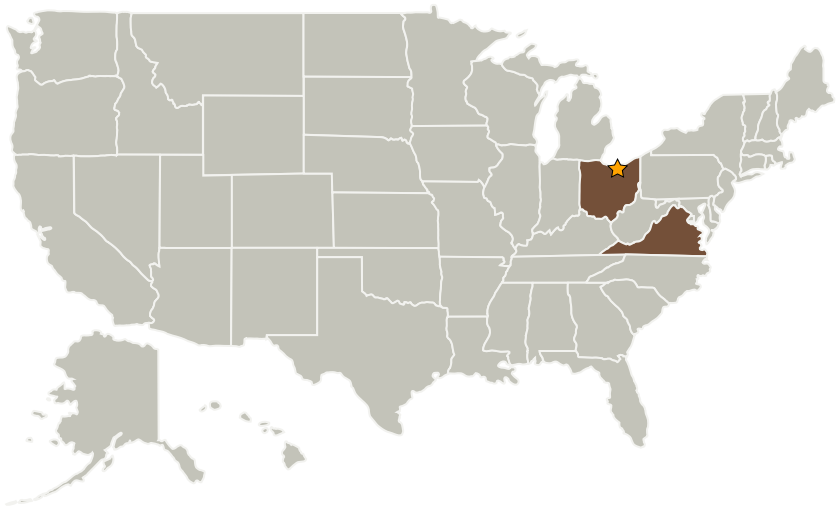
Lunar Surface Navigation, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

To support extended lunar operations, precision localization and route mapping is required for planetary EVA, manned rovers and lunar surface mobility units. A process called multilateration is proposed coupled with the use of an IEEE 1588 Precision Time Protocol (PTP). This protocol was created specifically to address timecode inaccuracies across distributed nodes on a non-deterministic network like Ethernet. Multilateration is a method widely used for air traffic control. The innovation is the establishment of a fault tolerant, field scalable, high precision navigation system that can and support the size, weight, and power (SWaP) goals by applying mature technologies to provide an innovative navigation infrastructure while naturally supporting data and voice communications on the same network. Such a system provides a precise and reliable navigation backbone and establishes a core infrastructure for long term occupation. Selected key components of the system as defined in the Phase I period will be functionally validated through use of existing Sensis products to validate predicted performance and demonstrate a TRL level 4 is achieved and the end of Phase I. An end-to-end demonstration would follow at the end of the Phase II period to achieve a TRL level 6.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Progeny Systems Corporation	Supporting Organization	Industry	Manassas, Virginia

Primary U.S. Work Locations	
Ohio	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.1 Sensing and Perception
    - TX04.1.2 State Estimation